PATENT ABSTRACTS OF JAPAN

(54) STILL IMAGE MOVING IMAGE RECORDING DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a still image moving image recording device in which audio recording is not interrupted even when a still image is recorded during recording of a moving image by adopting a common hardware configuration of a recording circuit for a still image and moving image so as to effectively use a recording capacity of the recording medium even when the still image and a moving image are recorded in mixture.

SOLUTION: An image compressor 5 compresses an input image based on a compression parameter 8a fed from an image compression system changeover device 8. A primary storage device 6 applies packet processing to audio data 3a and image data 5a. A secondary storage device 7 stores packet data 6a onto a removable recording medium. A CPU 14 in the image compression system changeover device 8 gives a moving image compression parameter 9a stored in a moving image compression parameter storage section 9 when a moving image recording button 12 is operated and gives a still image compression parameter 10a stored in a still image compression parameter storage section 10 when a still image recording button 13 is operated to the image compressor.

CLAIMS

[Claim(s)]

[Claim 1]A still picture moving image recorder comprising:

An image compression device which compresses an input picture signal and is

changed into image data.

A recorder which records image data outputted from said image compression device on a recording medium.

An image compression system switching arrangement which switches an image compression system by switching a graphical-data-compression parameter of said image compression device in the time of animation recording and still picture recording.

[Claim 2]The still picture moving image recorder according to claim 1wherein said image compression system switching arrangement switches compression technology to a compression ratio lower than the time of animation recording at the time of still picture recording.

[Claim 3]The still picture moving image recorder according to claim 1wherein said image compression system switching arrangement changes compression technology to an intra coding frame or a forward direction prediction-coding frame at the time of still picture recording.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the still picture moving image recorder which enabled it to record an animation and a still picturefor example using general-purpose video coding-standard standardssuch as MPEG 2.

[0002]

[Description of the Prior Art]After choosing arbitrary still picture signals out of a video camera output signal and recording on digital memoriessuch as RAMrecording a moving image signal on JP3-34686AThe digital still picture signal recording and reproducing device which divides into two or more tracks the signal read from the digital memory one by oneand was recorded on the digital sound signal record section is indicated.

[0003]In JP5-36205Athe magnetic recording medium which carried out possible [of the animation photography] during the timer operation at the time of the static image photographing which used the timer is indicated.

[0004]While recording on still picture recording area by making into a digital still picture signal the specific thing in the analog animation which followed JP5-115053AThe magnetic recording medium which enabled it to understand the contents of the still picture currently recorded at the time of moving image reproduction is indicated by by continuing and recording the still picture also on recording animation area.

[0005]In the video camera which can carry out simultaneous record of an animation and the still picture at JP7-193777AThe video camera kept from leaving an imperfect still picture by performing record drawing release mode after

recording a still picture signal thoroughlywhen recording release mode is chosen in the middle of record of a still picture signal is indicated.

[0006]

[Problem(s) to be Solved by the Invention]The conventional device which enabled it to record an animation and a still picture records an animation on magnetic tape with an analog signaland he is trying to record a still picture on a digital sound signal record section as a PCM-ized digital signal. For this reasonan equipment configuration becomes two digital disposal circuits with a digital signal processing circuit are required for an analog signal processing circuit and still picture record to recording animationsand complicated. In order to reproduce the animation and still picture which were recordedtwo regenerative circuits corresponding to each recording method are required.

[0007]When static image photographing is performed during animation recordingthe duplicate record of the same scene is carried out on the both sides of an analog signal and a digital signal. When only a still picture is recordedthe analog signal record section for animations is not used. For this reasonthe storage capacity of recording mediasuch as magnetic tapemay be unable to be used effectively.

[0008]If static image photographing is performed during animation photographyin order to record the digital signal of the photoed still picture on a digital sound signal record sectionwhile recording the digital signal of a still picturethere is a problem that audio record breaks off.

[0009]It aims at providing the still picture moving image recorder which can use the storage capacity of a recording medium effectively even when mixture recording of an animation and a still picture is performedwhile it was made in order that this invention might solve such a technical problemand carrying out hard structure of the circuit of a recording animation and still picture record in common.

[0010]

[Means for Solving the Problem]In order to solve said technical problemthis invention is characterized by a still picture moving image recorder comprising the following.

An image compression device which compresses an input picture signal and is changed into image data.

A recorder which records image data outputted from said image compression device on a recording medium.

An image compression system switching arrangement which switches an image compression system by switching a graphical-data-compression parameter of said image compression device in the time of animation recording and still picture recording.

[0011]A described image compression technology switching arrangement switches compression technology to a compression ratio lower than the time of animation recording at the time of still picture recordingfor example.

[0012]As for a described image compression technology switching arrangementit is desirable at the time of still picture recording to consider compression technology

as composition used as an intra coding frame (I picture) or a forward direction prediction-coding frame (P picture).

[0013]A still picture moving image recorder concerning this invention switches an image compression system automatically in the time of animation recording and still picture recordingand records compressed image data on a recording medium.

[0014]

[Embodiment of the Invention]Hereafterthis embodiment of the invention is described based on an accompanying drawing. Drawing 1 is a block configuration at the still picture moving image recorder concerning this invention. This invention is characterized by the still picture moving image recorder 1 comprising the following. Speech input system 2.

The speech compression device 3 as a speech processing unit which changes into the voice data 3a the input voice signal 2a outputted from the speech input system 2.

Picture input device 4.

The image compression device 5 which compresses the input picture signal 4a outputted from the picture input device 4and is changed into the image data 5aWhile storing temporarily the image data 5a outputted from the voice data 3a outputted from the speech compression device 3and the image compression device 5The record data generating device 6 which packet-izes the voice data 3a and the image data 5a which were stored temporarilyand generates and outputs the packet data 6aThe recorder 7 which records the packet data 6a outputted from the record data generating device 6 on an exchangeable recording mediumThe image compression system switching arrangement 8 which switches an image compression system by switching the graphical-data-compression parameter 8a which specifies the graphical-data-compression operating condition of the image compression device 5 in the time of animation recording and still picture recording.

[0015]The speech input system 2 is provided with the sound signal processing circuit etc. which amplify the audio signal which collected the sound with the microphone and the microphone on a predetermined level. After the speech compression device 3 changes the input voice signal 2a into a digital signalit is provided with the encoder circuit for sounds etc. which perform a data compression and output voice data. The picture input device 4 equips an imaging optical systemimage sensorssuch as CCDand the picturized picture signal with the picture signal processing circuit etc. which perform various kinds of analog signal processing.

[0016]The image compression device 5 is provided with the encode circuit for MPEG 2etc.for example. This image compression device 5 is considering the picture as the composition which performs compression operations on the graphical-data-compression conditions specified by the compression parameter 8a supplied from the image compression system switching arrangement 8.

[0017]The primary storage 6 is provided with the memory for storing temporarily

the voice data 3a and the image data 5athe data processing circuit for packet-izing each data 3a and 5a stored temporarilyetc.

[0018]The secondary storage 7 is provided with the recording-medium applied part for equipping with exchangeable recording mediasuch as a tapea diskand a memory cardthe record circuit which records the packet data 6a on the recording medium with which it was equippedetc.and records the packet data 6a supplied from the primary storage 6 on an exchangeable recording medium.

[0019]The image compression system switching arrangement 8 is provided with the following.

The compression parameter storage parts store 9 for animations which stored the compression parameter 9a for animation recording.

The compression parameter storage parts store 10 for still pictures which stored the compression parameter 10a for still picture recording.

The parameter selection circuitry 11 which chooses the parameter supplied to the image compression device 5.

While supervising the operating condition of the animation recording button 12 and the still picture recording button 13 and determining recording modeCPU14 which controls the selection switching operation of the parameter selection circuitry 11 so that the compression parameter for animation recording is supplied to the image compression device 5 based on the determined recording mode at the time of animation recordingand so that the compression parameter for still picture recording is supplied to the image compression device 5 at the time of still picture recording.

[0020]The compression parameter for animations has specified the bigger compression ratio than still picture recording. The compression parameter for animations has permitted all of three kinds of codingan intra coding frame (I picture)a forward direction prediction-coding frame (P picture)and a bidirectional prediction-coding frame (B picture). When generating the image compression data for animationsthe compression parameter for animations is set up so that the quantization coefficient of the first macro block may become in addition to one.

[0021]The compression parameter for still pictures has specified the compression ratio smaller than animation recording. The compression parameter for still pictures may be made to perform image coding by a forward direction prediction-coding frame (P picture)when still picture recording continues in predetermined time and is required on the principle of an intra coding frame (I picture). When the compression parameter for still pictures generates the image compression data for still pictureshe is trying to fix the quantization coefficient of the first macro block to 1.

[0022]CPU14 judges it as animation recording modewhen the animation recording button 12 is pushedit controls the parameter selection circuitry 11and supplies the compression parameter 9a for animation recording to the image compression device 5. CPU14 makes animation recording continuewhile the depression of the animation recording button 12 is continued.

[0023]CPU14 judges it as still picture recording modewhen the still picture recording button 13 is pushedand it supplies the compression parameter 10a for still picture recording to the image compression device 5 via the parameter selection circuitry 11. When CPU14 records the still picture for one frame from the time of detecting the depression of the still picture recording button 13he is trying to terminate still picture recording mode. While the still picture recording button 13 is pushedit is good also as composition which continues still picture recording for still picture recording mode with the frame number per same unit time as animation recordingor the frame number per unit time less than the time of animation recording.

[0024]When the still picture recording button 13 is pushed in the state where the animation recording button 12 is pushed and it is operating by animation recording modeCPU14 switches a graphical-data-compression parameter from the object for animations to still pictures only the between for one frame. While the still picture recording button 13 is pushedit may be made for CPU14 to make still picture recording mode continue.

[0025]The image compression device 5 compresses an input picture signal based on the graphical-data-compression parameter supplied from the image compression system switching arrangement 8and changes it into image data. When the image compression device 5 generates the image compression data for still pictures based on the compression parameter for still picture recordinghe is trying to fix the quantization coefficient of the first macro block to 1 here. When generating the image compression data for animations based on the compression parameter for animation recordingthe image compression device 5 is set up so that the quantization coefficient of the first macro block may not be set to 1.

[0026]Thusit becomes possible to choose only still picture data automatically at the time of reproductionand to reproduce by whether the quantization coefficient of the first macro block is fixed to 1by recording on a recording medium whether it was recorded by the still picture recording modeor it was recorded in recording animation mode.

[0027]Nextoperation of the still picture moving image recorder 1 concerning this invention is explained. CPU14 in the image compression system switching arrangement 8 judges that the animation recording button 12 is pushed with animation recording modeand supplies the compression parameter 9 for animation recording to the image compression device 5. The image compression device 5 outputs the image data which compressed and compressed the inputted image based on the compression parameter for animation recording. The primary storage 6 packet-izes the voice data outputted from the speech compression device 3and the image data outputted from the image compression device 5and supplies packet data to the secondary storage 7. The secondary storage 7 records packet data on exchangeable recording media (a tapea diska memory cardetc.). Therebythe recording of an animation is made.

[0028]CPU14 in the image compression system switching arrangement 8 judges that the still picture recording button 13 is pushed with still picture recording

modeand supplies the compression parameter for still picture recording to the image compression device 5. The image compression device 5 outputs the image data which compressed and compressed the inputted image for one frame based on the compression parameter for still picture recording. The image data for one compressed frame is packet-ized with the primary storage 6is supplied to the secondary storage 7and is recorded on exchangeable recording media (a tapea diska memory cardetc.).

[0029]When the still picture recording button 13 is pushed during animation recordingonly the between for one frame switches the graphical-data-compression parameter 8a which supplies CPU14 in the image compression system switching arrangement 8 to the image compression device 5 from the object for animations to still pictures. Thereforethe image compression device 5 returns to a compression state for animationsafter only the between for one frame compresses an inputted image based on the compression parameter 10a for still picture recording from the compression state for animations. The image data 5a outputted one by one from the image compression device 5 is packet-ized with the primary storage 6is supplied to the secondary storage 7and is recorded on exchangeable recording media (a tapea diska memory cardetc.).

[0030]Thussince a series of animation recording operation is not interrupted only for a compression parameter being changed only the between for one frame which carries out still picture recording even if it performs still picture recording during animation recordinga still picture can be recordedwithout interrupting animation recording. Thereforevoice recording does not break off at the time of animation recording. Since it is the composition which divides an animation and a still picture into another field etc.and does not record thembut changes and records the compression technology of the picture for one frame with which the recording as a still picture was demanded when simultaneous recording of an animation and a still picture is performedit can use effectivelywithout making storage capacity of a recording medium useless. In still picture recording modeit is a refreshable coding frame only with the framessuch as an intra coding frame (I picture)about the inputted image for one frameand since the rate of graphical data compression is made low and recordedrecord of a high definition still picture can be performed.

[0031]The still picture moving image recorder concerning this inventionIt becomes possible to choose only still picture data automatically at the time of reproductionand to reproduce by whether the quantization coefficient of the macro block of the beginning of image data is fixed to 1since it is recording on the recording medium whether it was recorded by the still picture recording modeor it was recorded in recording animation mode.

[0032]Although the image compression system switching arrangement 8 side was equipped with the compression parameter for animation recording and for still picture recording and the composition which supplies the compression parameter according to recording mode to the image compression device 5 from the image compression system switching arrangement 8 side was shown by drawing 1The image compression device 5 side is equipped with the compression parameter for

animation recording and for still picture recordingThe recording mode instructions which show animation recording mode or still picture recording mode from the image compression system switching arrangement 8 side are supplied to the image compression device 5and it may be made for the image compression device 5 to switch an image compression system based on the supplied recording mode instructions.

[0033]

[Effect of the Invention]The still picture moving image recorder applied to this invention as explained aboveSince it had the image compression system switching arrangement which switches an image compression system by switching the graphical-data-compression parameter of an image compression device in the time of animation recording and still picture recordingWhile carrying out circuit (hard) composition of a recording animation and still picture record in commoneven when mixture recording of an animation and a still picture is performedthe still picture moving image recorder which can use the storage capacity of a recording medium effectively can be provided.

[0034]High-definition still picture record is attained by switching the compression technology of a described image compression equipment to a compression ratio lower than the time of animation recording at the time of still picture recording.

[0035]It is considering compression technology as the composition used as an intra coding frame (I picture) or a forward direction prediction-coding frame (P picture) at the time of still picture recordingand the high-definition still picture record of it is attained.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a block lineblock diagram of the still picture moving image recorder concerning this invention.
[Description of Notations]
1 A still picture moving image recorder and 2 A speech input system and 3 A speech compression device which constitutes a speech processing unitFour picture input devices and 5 [The compression parameter storage parts store for still pictures11 parameter selection circuitryand 12 / An animation recording button and 13 / A still picture recording button14 CPU] An image compression device6 primary storage7 secondary storageand 8 An image compression system switching arrangement and 9 The compression parameter storage parts store for animationsand 10